MultiAP 700G

User Manual

Aug-12

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Table of Contents

1 INTRODUCTION AND SCOPE 3
2 PRODUCT FEATURES 3
3 INSTALLATION 4
5.1 INSTALLATION PROCEDURES 4
5.2 QUICK START 6
4 INFORMATION 6
6.1 SYSTEM 6
6.2 WIRELESS 7
6.3 WDS 8
6.4 EVENT LOG 8
6.5 NEIGHBOR APS 9
5 CONFIGURATION 10
7.1 SYSTEM SETTINGS 10
7.2 WIRELESS NETWORKS SETTINGS 16
7.3 ADVANCED SETTINGS 26
7.4 WDS SETTINGS 30
7.5 SNMP SETTINGS 32
7.6 WEB ADMIN SETTINGS 35
6 DIAGNOSTIC TOOLS 37
7 COMMANDS 38
8 PER USER VLAN TAGGING 40
APPENDIX A 41
APPENDIX B 42

1 Introduction and Scope

MultiAP 700G is a carrier-grade 802.11b/g Wi-Fi access point with centralized management system. It is a powerful solution for building wireless networks for Wireless Internet service, wholesalers and enterprises. Each MultiAP 700G is loaded with essential features such as Multiple SSID (virtual AP with distinct ESSID and BSSID), VLAN, and a high-gain antenna.

One MultiAP 700G can masquerade up to 16 different access points. Each virtual access point can have its own security policy (e.g. WPA, WPA2, etc.) and authentication mechanism (e.g. 802.1x, open, captive portal, etc), to facilitate building your wholesale network much faster, easier and more cost-effective than ever before. MultiAP 700G comes with a high-power Wi-Fi transmitter which greatly enhances coverage and performance.

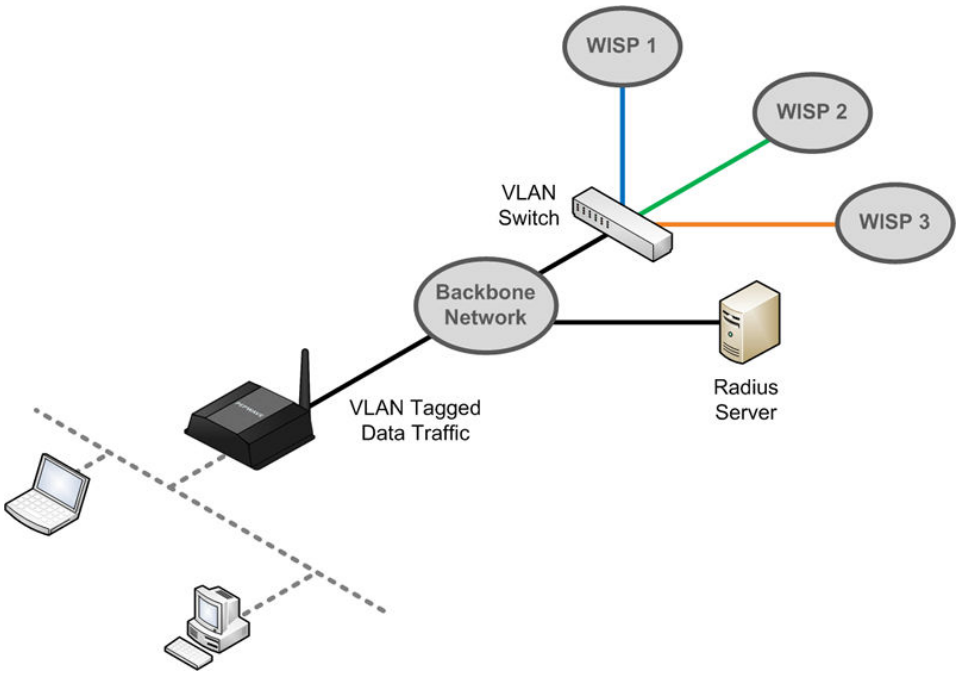
2 Product Features

Key features of MultiAP 700G:

- Designed for wholesale wireless networks with multiple SSID and VLAN support
- Independent security policies and encryption mechanisms per virtual AP
- Centralized managed via web based MultiAP Central Management System (PCMS)
- High-power output enhances coverage and lowers cost of ownership
- WMM (Wi-Fi Multimedia) and QoS (Quality of Service) Support
- WDS (Wireless Distribution System) Support
- Captive Portal Support
- Mesh Connector Bridging

3 Installation

MultiAP 700G acts as a bridge between the wireless and the wired Ethernet interface. A typical setup is as follows:



3.1 Installation Procedures

1. Attach the antenna to the MultiAP 700G unit.
2. Connect the LAN port on the unit with the backbone network using an Ethernet cable. The port could auto sense the cable is straight-through or cross-over.
3. Connect the power adapter to the power connector of the unit, and then plug in the power adapter.
4. Wait for the status LED to turn green.
5. Connect a PC to the backbone network, and configure the IP address of the PC to be any IP address between 192.168.0.4 and 192.168.0.254, with subnet mask of 255.255.255.0.
6. With Microsoft Internet Explorer 6 or above, or Mozilla Firefox 2.0 or above, connect to the URL https://192.168.0.3.
7. When prompted, enter the default admin login ID and password: **admin** and **public** respectively. This default username and password can be changed in the web admin. Please refer to section 5.6.2 for details.
8. After logging in, the following Main Menu page appears to facilitate further configuration of the

MultiAP 700G unit:

3.2 Quick Start

By default, an access point is preset with SSID: **wireless**

The default access point bridges the Wi-Fi interface to the Ethernet port, with both encryption and VLAN tagging disabled.

To access the backbone network connected via the Ethernet port of the unit, establish a session at the Wi-Fi interface with a Wi-Fi client. After establishing a Wi-Fi client session, information about the established Wi-Fi session appears at the Web Administration Interface of MultiAP 700G, under the section at ***Information-> Wireless***.

4 Information

4.1 System

System Information	
AP Name	This field shows the name of the system entered in the configuration.
Location	This field shows the location entered in the configuration.
Domain Name	This shows the domain name used for this system.
Network IP Mode	This field can be set in ***Configure > System***. The three options available are: **DHCP**, **Static IP** and **PPPoE (Router Mode only)**.
Network IP Address	This shows the current IP used on the system.
Network Subnet Mask	This shows the current subnet mask used on the system.
Network Gateway	This shows the detected/assigned network gateway of the device.
Network DNS	This shows the detected/assigned network DNS of the device.
Software Versions	This shows the current firmware version running on the system.
Serial Number	This shows the serial number of the device.
Up Time	This shows the time has been up since boots up.
System Time	This shows the time of day in respect to the time zone selected.
Time Zone	This shows the time zone the system is using.
Mac Address	This shows the LAN MAC address of this system.

Comment:

Comment:

Comment:

L2TP Tunnel	
Status	This shows the status of the L2TP service.
Tunnel IP Address	This shows the IP acquired in the established tunnel.

Tunnel Netmask	This shows the subnet mask acquired in the established tunnel.

Firmware / Flash	
Firmware Version	This shows the firmware version loaded into the flash partitions.
Flash Status	This shows the firmware status on the flash partitions.
Boot from	This indicates which flash partition boots up the system.
Firmware Upgrade Target	This shows which flash partition is used for firmware upgrade.

4.2 Wireless

Wireless Information	
Name	This shows the system name defined in previous section.
Number of WLANs	This shows number of added SSIDs.
Current Clients	This indicates the number of associated clients.
Current Channel	This shows which 802.11 channel the system is using.
Current Status	This shows the current status of the device.

Comment: ? any other than On?

Connected Clients	
Manufacturer	This shows the manufacturer based on the MAC prefix.
MAC address	This shows the client MAC address.
WLAN SSID	This shows which SSID the client is associated.
VID	This shows the VLAN ID used on the SSID.
Type	This shows the radio mode of the client.
Authentication	This shows the client authentication.
Status	This shows the association status and the associated duration.
Details	This links to the detailed page of each client.

For information about the Clients Details, please refer to section 5.2.

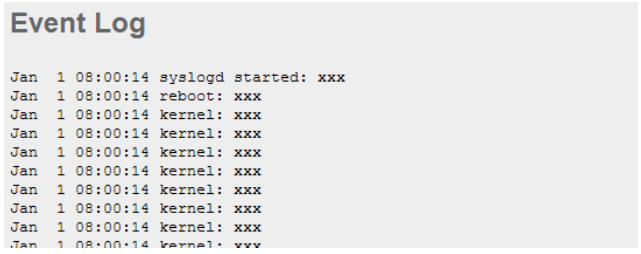
4.3 WDS

Auto WDS Status	
Bssid	This shows the wireless MAC address of the device.
Parent	This shows the parent node of the device.
Channel	This shows the channel of the existing Bssid.
Level	This shows the hop level of the device.
State	This shows the state of the node: wired or wireless.

Neighbor WDS APs	
Bssid	This shows the wireless MAC address of the Neighbor WDS node.
Parent	This shows the parent node of the Neighbor WDS node.
Channel	This shows the channel of the existing Bssid.
RSSI	This shows the signal strength of the node.
Level	This shows the hop level of the node.
State	This shows the state of the node: wired or wireless.

4.4 Event Log

Upon selecting ***Event Log*** from the ***navigation bar*** on the left-hand-side of the Main Menu, the system log is displayed. The system log is intended to provide information to aid troubleshooting in the event of operational issues.


Event Log
Jan 1 08:00:14 syslogd started: xxx
Jan 1 08:00:14 reboot: xxx
Jan 1 08:00:14 kernel: xxx
Jan 1 08:00:14 kernel: xxx
Jan 1 08:00:14 kernel: xxx
Jan 1 08:00:14 kernel: xxx
Jan 1 08:00:14 kernel: xxx
Jan 1 08:00:14 kernel: xxx
Jan 1 08:00:14 kernel: xxx

Comment:

4.5 Neighbor APs

Neighbor APs	
Neighbor AP Discovery	This shows the feature Neighbor AP Discovery is enabled. To disable or configure the Scanning Interval and Scanning Time options, please refer to section 5.3.2.
Scanning Interval	This shows the scanning interval for Neighbor AP Discovery.
Scanning Time	This shows the scanning time for Neighbor AP Discovery.

Neighbor APs	
Manufacturer	This shows the manufacturer based on the MAC prefix.
SSID	This shows the ESSID of the scanned access point.
Ch	This shows the channel of the scanned access point.
RSSI	This shows the signal strength of the access point.
Security	This shows the encryption type of the access point used.
BSSID	This shows the wireless MAC address of the access point.
Last Seen	This indicates the time stamp of the access point scanned.
Status	This shows whether the access point can be detected or not.

5 Configuration

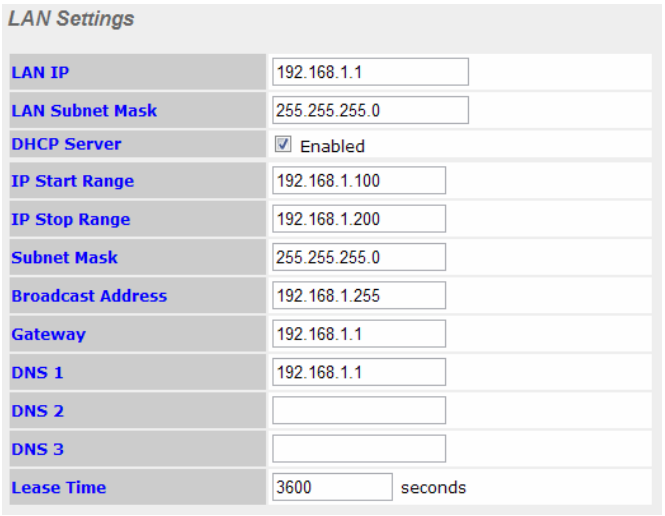
5.1 System Settings

General Access Point Settings	
AP Name	A user-specified name for the access point. This value can be retrieved via SNMP.
Location	A user-specified name for the location of the access point. This value can be retrieved via SNMP.
AP Mode	This option enables the access point running as a **bridge** or a **router**. When the access point runs as a router, the Management VLAN ID is ignored and the LAN settings appear for proper network setup.
Domain Name	Domain name can be set for wireless clients to have a readable name for both web management and captive portal redirection URLs.
Server IP	This specifies the unique IP address for the MultiAP 700G unit to communicate on the Ethernet segment. This IP address is distinct from the admin IP address 192.168.0.3 on the Ethernet segment. If **Keep Default IP** is set, the default IP would be available on the system along with the Server IP setting. If **DHCP** is set, the IP address of the MultiAP 700G unit is then acquired from a DHCP server on the Ethernet segment. If **Static IP** is set, it is required to enter the information related to that static IP, including **Static IP address, Subnet Mask, Default Gateway and DNS Server**. If **PPPoE** is set, it is required to enter the information related to that PPPoE connection: **PPPoE Username**, **PPPoE Password**, **PPPoE Service Name**. This option is only available with **Router** mode.
Management VLAN ID	This specifies the VLAN from which management sessions are allowed. The establishment of management sessions is restricted only to the specified VLAN ID. If **Management VLAN ID** is set to zero, no VLAN restriction is applied. The default value of this setting is **zero**. It means no tagging is enabled (instead of tagged with zero). This option is only available in **Router** mode.
Timezone	This option specifies the time region to be used for representing the time on the system.
NTP Server	This is the Network Time Protocol (NTP) Server hostname to be used for synchronizing system clock of MultiAP 700G. The default value of this setting is pool.ntp.org.

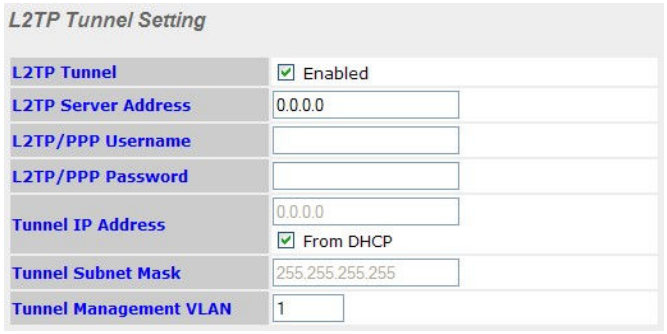
STP	Spanning Tree Protocol, STP can be enabled to prevent path redundancy. With this enabled, two more options are provided: **Bridge Priority** and **Ethernet Path Cost**.
Bridge Priority	(If STP is enabled,) the parameter is set to give the likeliness for root switch election.
Ethernet Path Cost	(If STP is enabled,) this gives the preference to provide the best path from the switch to the root switch.

5.1.1 LAN Settings

LAN Settings will only be available when the AP Mode in the previous section had been selected as **Router** mode. You can use the 700G as a DHCP server for other devices behind.

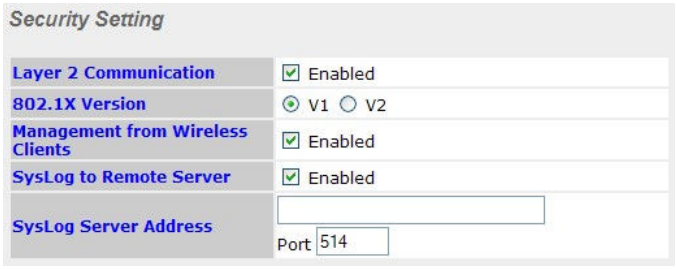


5.1.2 L2TP Tunnel Settings



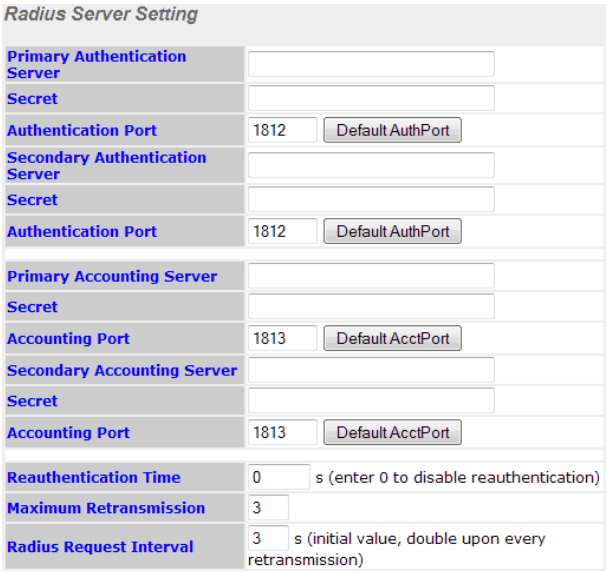
L2TP Tunnel Settings	
L2TP Tunnel	Enabling L2TP option on the system would start the tunnel establishment from the access point to the server for centralized traffic management.
L2TP Server Address	This specifies the L2TP server IP address for the access point to connect to.
L2TP/PPP Username	This specifies the L2TP/PPP Username for tunnel authentication purpose.
L2TP/PPP Password	This specifies the L2TP/PPP Password for tunnel authentication purpose.
Tunnel IP Address	This specifies the unique IP address for the MultiAP 700G unit to communicate over the tunnel. If **From DHCP** is set, the IP address of the MultiAP 700G unit is then acquired from a DHCP server over the tunnel. Tunnel IP Address and Tunnel Subnet Mask will be disabled automatically.
Tunnel Subnet Mask	This setting specifies the subnet mask of the MultiAP 700G unit over the tunnel.
Tunnel Management VLAN	This specifies the VLAN from which management sessions are allowed over the tunnel. The establishment of management sessions is restricted only to the specified VLAN ID. If **Management VLAN ID** is set to zero, no VLAN restriction is applied. The default value of this setting is **zero**. It means no tagging is enabled (instead of tagged with zero).

5.1.3 Security Settings



Security Settings	
Layer 2 Communication	Layer 2 is in reference to the second layer in the ISO Open System Interconnect model. When this option is **disabled**, clients on the same VLAN, SSID or subnet are not allowed to communicate directly via the Layer 2 Protocol(s). Traffic is passed to upper communication layer(s). With this option **enabled**, clients on the same VLAN are allowed to communicate with each other directly. (Windows network resources browsing will be possible.) By default, the setting is **enabled**.
802.1X Version	This setting selects between v1 or v2 of the 802.1x EAPOL. When **v1** is selected, both v1 and v2 clients can associate with the access point. However, when **v2** is selected, only v2 clients can associate with the access point. Most modern wireless clients support v2. In the event that there are stations that do not support v2, select the option v1. By default, the value of the setting is **v2**.
Management from Wireless Clients	With this option **enabled**, Web Admin is accessible from the Wi-Fi segment of MultiAP 700G. By default, it is **enabled**.
Syslog to Remote Server	With this option **enabled**, logs are sent to an external Syslog server. By default, this option is **disabled**.
Syslog Server Address / Port	When the **Syslog to Remote Server is enabled**, this option is enabled for entering the Syslog server **IP address** and **port number**. By default, the port number is **514**.

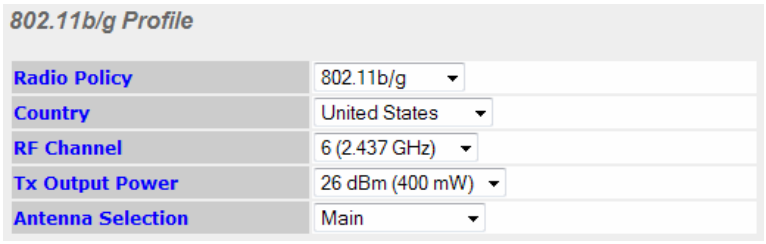
5.1.4 Radius Server Settings



Radius Server Settings	
Primary Authentication Server	When 802.1x authentication is configured, the Radius server specified by this setting will be used for authentication.
Secondary Authentication Server	This setting specifies the Radius server to be used for authentication in the event that the host specified by Primary Host is unavailable.
Secret	This is the secret for accessing the Radius server.
Authentication Port	This specifies the UDP port number for the Authentication port of the Radius server.
Primary Accounting Server	When 802.1x authentication is configured, the Radius server specified by this setting will be used for accounting.
Secondary Accounting Server	This setting specifies the Radius server to used for accounting in the event that the host specified by Primary Host is unavailable.
Secret	This is the secret for accessing the Radius server.
Accounting Port	This specifies the UDP port number for the Accounting port of the Radius server.
Re-authentication Time	This is the re-authentication time interval. Enter **0** to disable re-authentication. By default, it is set as **0 (disable)**.
Maximum Retransmission	This specifies the maximum number of retry for RADIUS authentication. By default, it is set as **3**.
Radius Request Interval	This specifies the time interval in second between each RADISU request attempt. Note that the request time interval would be doubled every

retransmission. By default, it is set as **3s**.

5.1.5 802.11b/g Profile



802.11 b/g Profile	
Radio Policy	Three options are available: • 802.11b/g (Mixed Mode): MultiAP 700G accepts both 802.11b and 802.11g client association requests. • 802.11b Only: MultiAP 700G accepts only 802.11b client association requests. • 802.11g Only: MultiAP 700G accepts only 802.11g client association requests.
Country	This setting specifies the country / region whose regulations the MultiAP 700G unit should follow. Users are required to choose their operating country based on their actual location. Laws, restrictions and regulations of use of electronic goods apply to different countries. Available RF channels and Maximum transmission power options rely on the selected operating country. By default, **United States** is selected.
RF Channel	This option selects the 802.11 channel to be utilized. Available options for 802.11b and 802.11g are from 1 to 11 and from 1 to 13 respectively, depend on the operating country selected in the previous option.
Tx Output Power	This option selects the transmit output power of the 700G device. Available options are from 26 dBm to 17 dBm and 20 dBm to 11 dBm, depend on the operating country selected in the previous option. By default, Tx Output Power is configured to be **26 dBm**.
Antenna Selection	For MultiAP 700G Outdoor units, the hardware may be equipped with two antennas for transmit and receive diversity. If the MultiAP 700G unit is equipped with two antennas, users can select **Main**, **Auxiliary** and **Both (Diversity)** with antenna diversity. By default, **Main** antenna is selected.

Comment: New feature

5.2 Wireless Networks Settings

Upon selecting ***Wireless Networks*** under Configure section from the navigation bar on the left, the following shows the configured SSID available on the system:

General Wireless Networks Settings	
Wireless Network SSID	The SSID of the virtual Access Point (AP).
Default VLAN ID	This setting specifies the VLAN ID to be tagged on all outgoing packets generated from the virtual AP (i.e. packets that travel from the Wi-Fi segment, through the MultiAP 700G unit to Ethernet segment via the LAN port). If 802.1x is enabled, a per-user VLAN ID can be specified in the authentication reply from the Radius server. If it is set, the value specified via Default VLAN ID will be overridden.
Admin Status	This option shows whether the virtual AP is enabled or disabled.
Security Policies	This option shows the configured wireless authentication and encryption methods.
BSSID	This field shows the detailed BSSID.

Wireless Networks Details	
Enable	Select **Yes** to enable the virtual AP, or **No** to disable the virtual AP. By default, the virtual AP is enabled.
Wireless Network SSID	This setting specifies the SSID of the virtual AP to be scanned by Wi-Fi clients. The value is not case sensitive. By default, the value is **MultiAP_XXXX**, where the substring **XXXX** in the SSID is replaced by the last four hex digits of the LAN MAC address of the unit.
Default VLAN ID	This setting specifies the VLAN ID to be tagged on all outgoing packets generated from the virtual AP (i.e. packets that travel from the Wi-Fi segment, through the MultiAP 700G unit to Ethernet segment via the LAN port). If 802.1x is enabled and a per-user VLAN ID is specified in the authentication reply from the Radius server, then the value specified via **Default VLAN ID** will be overridden. The default value of this setting is **0**. That means VLAN tagging is disabled (instead of tagged with zero).
Broadcast SSID	This setting specifies whether or not the ESSID of the virtual AP can be scanned by Wi-Fi clients. Note that the BSSID (i.e. the MAC address of the virtual AP) cannot be hidden from the scan. To associate with the virtual AP, clients must specify the correct ESSID upon association.

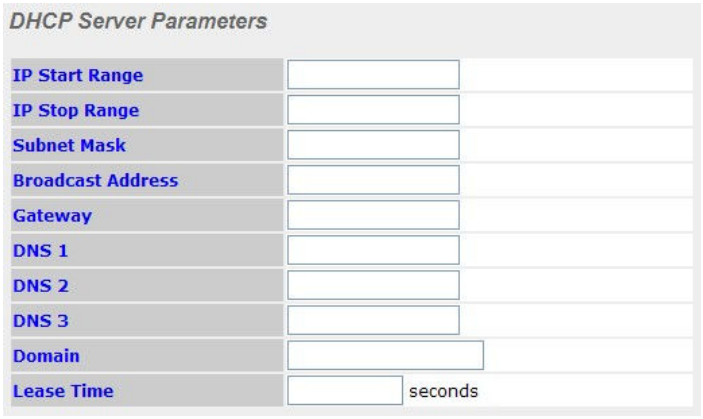
	Broadcast SSID is **enabled** by default.
Multicast Filter	This setting enables the filtering of multicast network traffic to the wireless SSID. By default, it is set as **enabled**.
Multicast Rate	This setting specifies the transmit rate to used for sending multicast network traffic.
Data Rate	There are two options on data rate: **Fixed, Auto** **Fixed** will forced all data packets to be transmitted into the selected transmit rate. **Auto** will automatically select the best transmit rate with a condition to use the selected transmit rate as the minimum auto transmit rate.
Default Quality of Service	The 802.1p QoS value to be marked on all outgoing packets generated from the virtual AP (i.e. packets that travel from the Wi-Fi segment, through the MultiAP 700G unit to Ethernet segment via the LAN port). If per-user or per-domain QoS value is specified, the Default Quality of Service value will be overridden. Possible values are **Gold**, **Silver** and **Bronze**.
DHCP Server Type	This setting selects among the following options: • **None**: DHCP requests will be passed to the Ethernet segment, and will not be processed by MultiAP 700G. • **Relay**: MultiAP 700G will forward DHCP requests to a specified DHCP Server. This option prevents broadcast messages from being propagated on the Ethernet segment. Upon selecting this option, the DHCP Server IP address will be prompted. • **Server**: MultiAP 700G will allocate and offer IP addresses locally. For further details, please refer to Section • • DHCP Server • Please refer to the following sections, 5.2.1 and 0 for details.
Security Policy	This setting configures the wireless authentication and encryption methods. Available options are: **None**, **Static WEP**, **802.1x** and **WPA**. Selecting **None** disables encryption. For details on the other options, please refer to the following sections: • **5.2.3 - Static WEP Parameters** • **0 - 802.1x Parameters** • **5.2.5 - WPA Parameters**
Maximum Associated Clients	This setting limits the number of associations allowed to the SSID. The default value **zero** would be treated as **unlimited**.
Access Control	The settings allow administrator to control the access through Mac address filtering. Available options are: **None**, **Deny all except listed**, **Accept all except listed**. For details on the other options, please refer to Section 5.2.6 - Access Control.

Alternative Radius Server Setting	The settings provide an alternative Radius setting for the SSID. With this enabled, the settings would overwrite the Radius settings under system in section Configure. For details on the other options, please refer to Section 5.1.4 Radius Settings.
Captive Portal	This setting enables the captive portal capability on the access point to do URL redirection with different authentication. For details on the other options, please refer to Section 5.2.7 Captive Portal Settings.
Bandwidth Management	This option enables the settings to control upstream and downstream limits. For details please refer to Section 5.2.8 – Bandwidth Management.
Alternative Layer 2 Communication Setting	With this option enabled, 3 more options for Layer 2 Communication settings will be available. For details, please refer to Section 5.2.9 – Alternative Layer 2 Communication Settings.
Wireless Network Filter	This option enables the access point to filter network traffic based on the users' defined rules. Users can use MAC address, IP address and protocol to form the matching rules to perform either drop or accept policy. For details please refer to Section 5.2.10 – Wireless Network Filters.
WMM	This option enables the Wi-Fi Multimedia (WMM), as known as Wireless Multimedia Extensions (WME) on the access point.
Mesh Connector Bridging	This option enables the transparent bridging functionality with MultiAP Mesh Connector to achieve true layer two transparency. This option should be checked if users want to bridge traffic from a 700G to Mesh Connector.

Comment:

5.2.1 DHCP Server

For the setting **DHCP Server Type**, if the value **Server** is selected, DHCP Server Parameters are entered via the following screen up selection:



DHCP Server Parameters	
IP Start Range	This setting specifies the first address in the range of IP addresses to be assigned to DHCP clients.
IP Stop Range	This setting specifies the last address in the range of IP addresses to be assigned to DHCP clients.
Subnet Mask	This setting specifies the subnet mask to be used by DHCP clients.
Broadcast Address	This setting specifies the broadcast address to be used by DHCP clients.
Gateway	This setting specifies the default routing gateway to be used by DHCP clients.
DNS 1	This setting specifies the IP address of the primary DNS Server to be offered to DHCP clients.
DNS 2	This setting specifies the IP address of the secondary DNS Server to be offered to DHCP clients.
DNS 3	This setting specifies the IP address of the tertiary DNS Server to be offered to DHCP clients.
Domain	This setting specifies the domain name of the Wi-Fi segment.
Lease Time	This setting specifies the length of time throughout which an IP address of a DHCP client remains valid. Upon expiration of the Lease Time, the assigned IP address will no longer be valid and the renewal of the IP address assignment will be required.

Comment:

5.2.2 DHCP Relay

For the setting **DHCP Server Type**, if the value **Relay** is selected, DHCP relay parameters will be available via the following screen up selection:

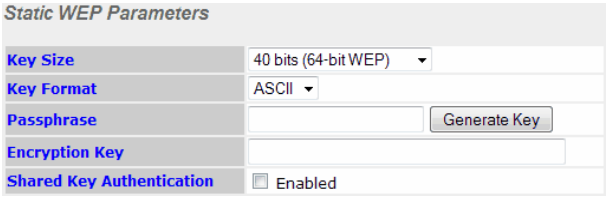
DHCP Relay Parameters	
DHCP Server IP	This setting specifies the IP address of the DHCP server.

5.2.3 Static WEP

The configuration of Static WEP parameters enables pre-shared WEP key encryption. Authentication is not supported by this method.

The security level of this method is known to be weak.

Static WEP parameters are entered via the following screen upon selection:

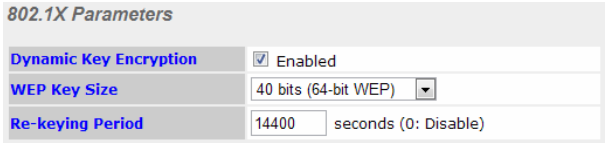


Static WEP Parameters	
Key Size	The setting can be configured as either **40 bits (64-bit WEP)**, **104 bits (128-bit WEP)** or **128 bits (152 bit WEP)**.
Key Format	The setting can be configured as either **ASCII** or **HEX**.
Passphrase	Combination of words and characters used to generate an encryption key. Click **Generate Key** to create the key.
Encryption Key	This setting specifies a user-specified encryption key value. For **ASCII** format, key length is either **5 or 13**. For **HEX** format, key length is either **10 or 26**.
Shared Key Authentication	This setting enables the use of shared key authentication. Open authentication is the default authentication.

Comment:

5.2.4 802.1x Parameters

The configuration of 802.1x parameters enables Radius-based 802.1x authentication with a dynamic WEP key. The configuration screen is as follows:



802.1x Parameters	
Dynamic Key Encryption	Check the box to enable the Dynamic Key Encryption. **Key Size** and **Re-keying Period** will be enabled automatically.
Key Size	The setting can be configured as either ***40 bits*** or ***104 bits***.
Re-keying Period	This setting specifies the length of time throughout which the broadcast key remains valid. Upon expiration of Re-keying Period, the broadcast key will no longer be valid and the renewal of the broadcast key will be required.

Comment:

Comment:

The default value **0** means to disable re-keying.

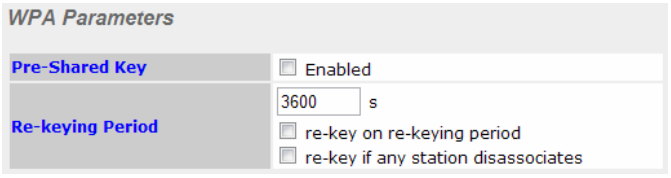
5.2.5 WPA parameters

The configuration of WPA parameters enables **WPA-TKIP** or **WPA2-AES**.

To enable WPA and WPA-PSK, configure WPA-TKIP. To enable WPA2 and WPA2-PSK, configure WPA2-AES.

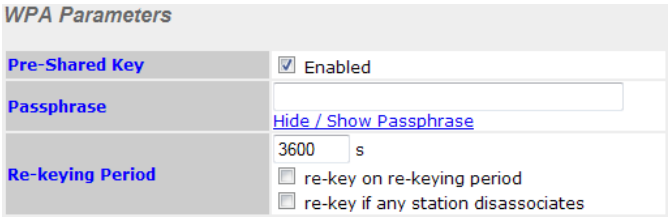
When WPA or WPA2 is configured, Radius-based 802.1x authentication with TKIP encryption method is enabled. Under this configuration, the **Pre-Shared Key** option should be disabled.

The security level of this method is known to be very high.



When WPA-PSK or WPA2-PSK is configured, a Pre-Shared Key, or Pass Phrase, is used for data encryption and authentication. Under this configuration, the **Pre-Shared Key** option should be enabled. Key length must be between 8 and 63 characters (inclusive).

The security level of this method is known to be high.



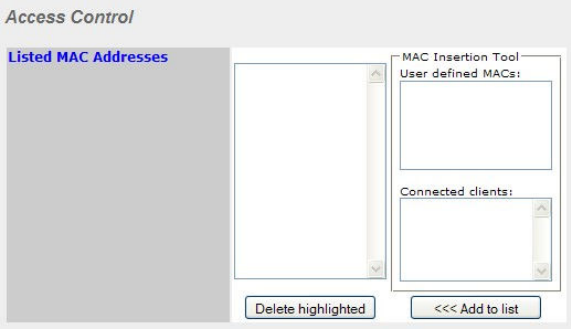
5.2.6 Access Control

The settings allow administrator to control the access through Mac address filtering.

Available options are: **None**, **Deny all except listed** and **Accept all except listed**.

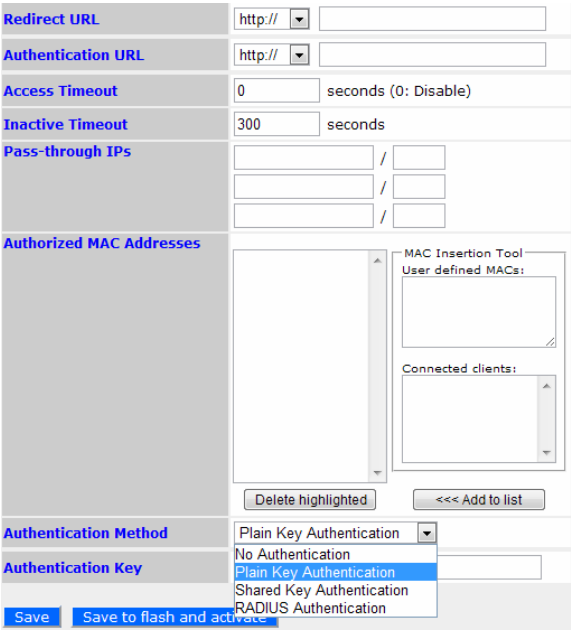
Enter or Choose MAC address(es) in the box of MAC Insertion Tool on the right, and then click **<<<Add to list**. MAC address(es) will be added into the filter.

To delete a selected MAC address in the list, click and highlight a MAC address in the box on the left, then click **Delete highlighted**.



5.2.7 Captive Portal Settings

User can build and develop their own Captive Portal using PHP and then redirect all clients to the assigned server for authentication.



Captive Portal Settings	
Redirect URL	This setting specifies the URL to be used to redirect the users. HTTP and HTTPS are available for the choice of protocols.
Authentication URL	This setting will only be available if you have chosen **Plain Key Authentication** or **Shared Key Authentication** as the authentication method. It specifies the authentication URL to be used. HTTP and HTTPS are available for the choice of protocols.

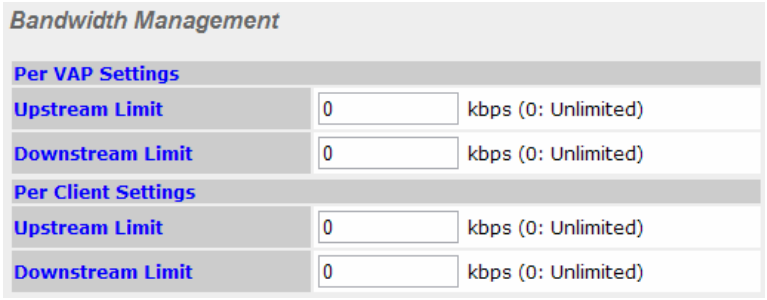
Comment:

Comment:

Access Timeout	This setting specifies the allowed access time. When the timeout reaches, users would be redirected to the “Redirect URL”.
Inactive Timeout	This option sets the value of timeout when user stays inactive.
Pass-through IPs	This setting specifies the IPs that users can go to without redirection control.
Authorized MAC Addresses	This setting specifies the list of MAC addresses in which the authentication and redirection are bypassed. The option is particularly useful when devices do not have browser capability, such as wireless VoIP phone.
Authentication Method	This setting specifies the method to do user authentication and the options are: **No Authentication**, **Plain Key Authentication**, **Shared Key Authentication**, and **RADIUS Authentication**.
Authentication Key	This setting specifies the authentication key which is only available when **Plain Key Authentication** or **Shared Key Authentication** has been selected.

Comment: new

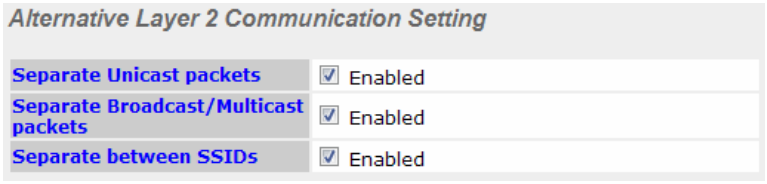
5.2.8 Bandwidth Management



Bandwidth Management	
Per VAP Settings / Per Client Settings	Upstream Limit and Downstream Limit can be set for each VAP or each Client.
Upstream Limit	This option set the upstream bandwidth limit. The default value **0** means **Unlimited**.
Downstream Limit	This option set the downstream bandwidth limit. The default value **0** means **Unlimited**.

Comment: new

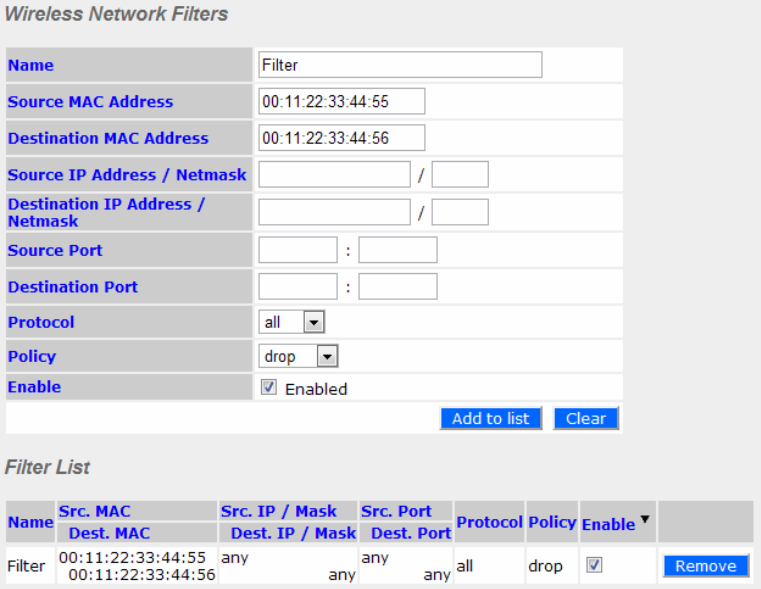
5.2.9 Alternative Layer 2 Communication Setting



Alternative Layer 2 Communication Setting	
Separate Unicast packets	Check the box to enable the separate unicast packet feature for Layer 2 communication.
Separate Broadcast / Multicast packets	Check the box to enable the separate broadcast / multicast packets feature for Layer 2 communication.
Separate between SSIDs	Check the box to enable the separate between SSIDs feature for Layer 2 communication.

Comment: new

5.2.10 Wireless Network Filters



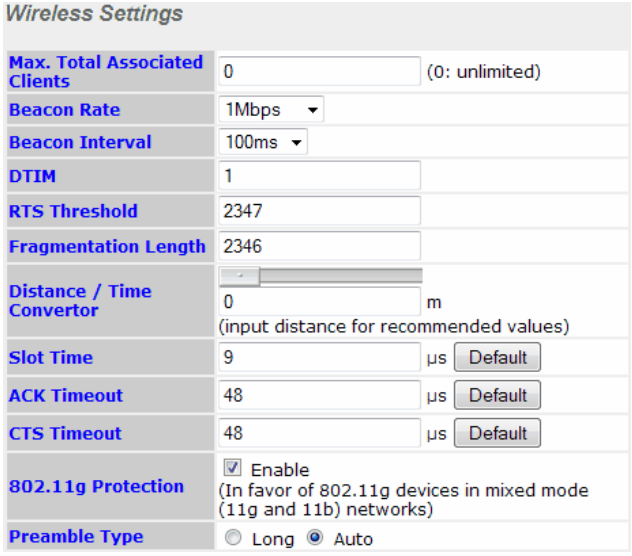
Wireless Network Filters	
Name	This setting defines the name of the filter.
Source / Destination MAC Address	This setting specifies the source / destination MAC address(es) to be filtered.
Source / Destination IP Address / Netmask	This setting specifies the source / destination IP address(es) and the Netmask to be filtered.
Source / Destination Port	This setting specifies the source / destination Port(s) to be filtered.
Protocol	This setting specifies the Protocol to be filtered.
Policy	This option defines the policy of this filter. Available options are **accept** and **drop**.
Enable	Check the box to **enable** or disable this filter.

You can delete any existing filter by clicking the **Remove** bottom on the right of the ***Filter List***.

5.3 Advanced Settings

Advanced Settings provides more options to fine tune the parameters on the system to achieve the optimal performance.

5.3.1 Wireless Settings



Wireless Settings	
Max. Total Associated Clients	This value defines the maximum number of clients in total can be associated with the device. The default number **0** means **unlimited**.
Beacon Rate	This setting provides the option to send beacon in different transmit bit rate and the bit rates are: **1Mbps**, **2Mbps**, **5.5Mbps**, **6Mbps**, **11Mbps**.
Beacon Interval	This setting provides the option to set the time between each beacon send. Available options are: **100ms**, **250ms**, **500ms**.
DTIM	This setting provides the option to set the frequency for beacon to include Delivery Traffic Indication Message, DTIM. The interval unit is in millisecond.
RTS Threshold	This setting provides the option to set the minimum packet size for the unit to send an RTS using the RTS/CTS handshake. Setting zero would disable this feature.
Fragmentation Length	This settings provides the option to set the fragmentation length.
Distance / Time Convertor	This is a convertor to automatically adjust the **Slot Time, ACK Timeout** and **CTS Timeout** by entering the distance between the device and the clients.
Slot Time	This setting provides the option to modify the unit wait time before it transmits.

Comment:

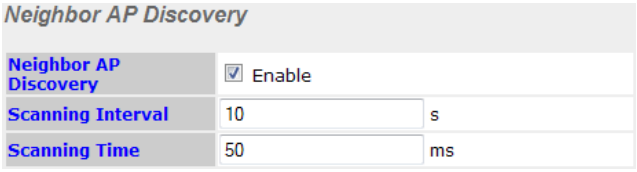
Comment: ???

Comment:

ACK Timeout	This setting provides the option to set the wait time to receive acknowledgement packet before doing retransmission.
CTS Timeout	This setting provides the option to specify the timeout for the unit to wait for CTS response in the RTS/CTS handshake.
802.11g Protection	When this option is enabled, 802.11g devices would be in favor in mixed mode (11g and 11b) networks.
Preamble Type	Preamble Type defines the length of the CRC block for communication between the AP device and adapters. Available options are **Long** and **Auto**. A long preamble type can be selected if the device is operating in a 'noisy' network environment. By default, it is set as **Auto**.

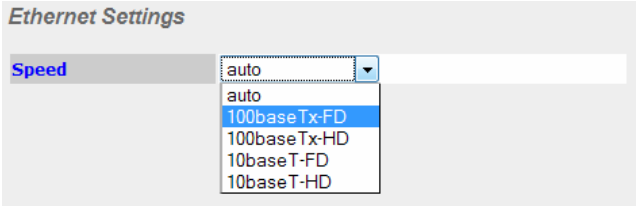
Comment:

5.3.2 Neighbor AP Discovery



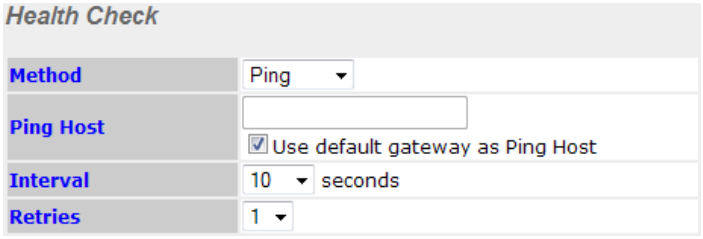
Neighbor AP Discovery	
Neighbor AP Discovery	Check the box to enable the function of scanning neighbor APs.
Scanning Interval	This setting determines how often the access point goes to other channels to discover Neighbor AP.
Scanning Time	This setting determines how long the access point stays on the other channels to discover Neighbor AP.

5.3.3 Ethernet Settings



Ethernet Settings	
Speed	This setting provides the option to set the speed of the Ethernet.

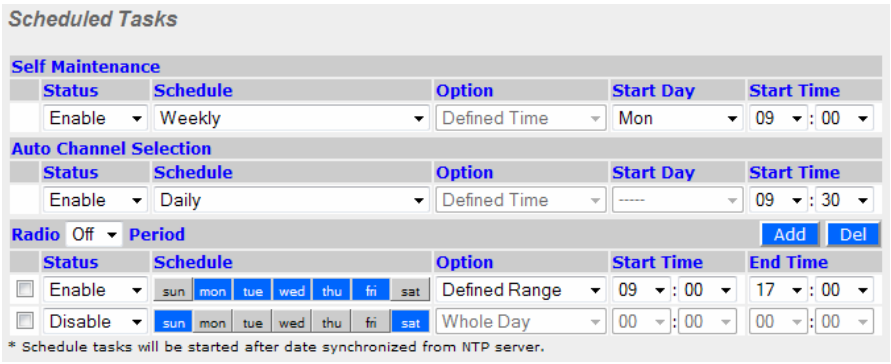
5.3.4 Health Check



Comment: new

Health Check	
Method	Select **Ping** to enable the health check function.
Ping Host	Enter the IP address of Ping host. By default, the box **Use default gateway as Ping Host** is checked and enabled.
Interval	This value defines the interval of health check pings.
Retries	The number of retry when the health check is failed.

5.3.5 Scheduled Tasks



Comment: the whole section has been updated

Scheduled Tasks	
Self Maintenance	The system would perform reboot based on the scheduled time selected.
Auto Channel Selection	The system would perform auto channel selection to avoid congested channel when no clients currently associated to the access point.
Radio On/Off Period	This option specify the time period which radio would be switched ON or OFF. If there are no entries, radio will be set as ON automatically.

Note

Schedule tasks will be started after date synchronized from NTP server.

5.4 WDS Settings

Wireless distributed system, WDS provides a way to link APs together when wired cabling is not preferable. This also extends the wireless coverage of the wireless network for the wireless clients.

There are two options available: **Auto** and **Manual**.

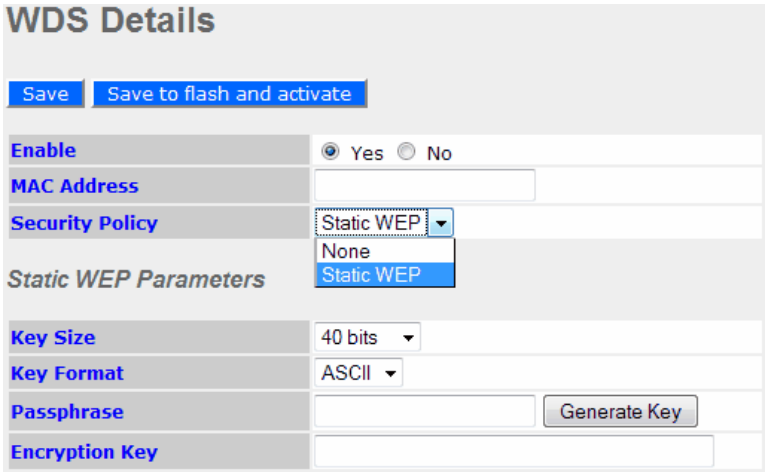
5.4.1 Auto WDS Mode

Auto WDS Mode	
Node Type	There are three options: **Auto Detect**, **Wired**, and **Wireless** • **Auto Detect** - the unit would check the connectivity to the default gateway via wired Ethernet to determine the node type. If there is connectivity to the default gateway, the unit would state its node type as gateway. Otherwise, the unit would state its node type as **node**. • **Wired**- the unit is expected to be wire-connected to provide public network access to other wireless nodes. • **Wireless** - the unit would search for the best gateway or node wirelessly in order to gain public network access.
AES passphrase	This setting gives the encryption passphrase for AES encryption to secure the date between APs. 700G devices will match this AES passphrase with each other and for those matched will be connected for Internet connection.

Comment:

5.4.2 Manual WDS Mode

By clicking the **ADD** button under ***Manual WDS Settings***, you can configure WDS connections manually.



Manual WDS Mode	
Enable	This option enables this entry.
MAC Address	This setting gives the MAC address of the other AP to form a WDS link.
Security Policy	For more detail, please refer to section 5.2.3 Static WEP.

Comment:

5.5 SNMP Settings

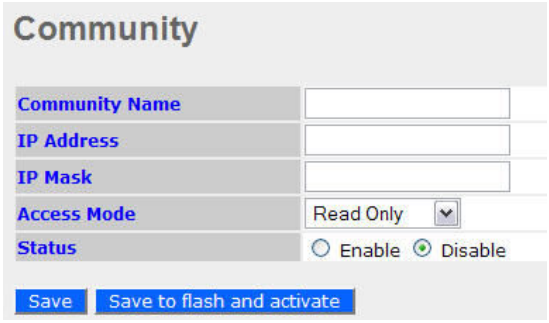
Upon selecting **SNMP Server Settings** from the navigation bar on the left-hand-side of the Main Menu, the following page is displayed to enable the configuration of SNMP server settings:

SNMP Settings	
Server Name	This setting specifies the name that identifies the SNMP server.
SNMPv1	This setting specifies whether to enable or disable the support for Version 1 of SNMP.
SNMPv2	This setting specifies whether to enable or disable the support for Version 2 of SNMP.
SNMPv3	This setting specifies whether to enable or disable the support for Version 3 of SNMP.
SNMP Trap	SNMP Trap is a message initiated from a client and sent to the 700G device. Once this option is enabled, the following two options for SNMP Trap will be available for configuration.
SNMP Trap Receiver Name	(When SNMP Trap is enabled) This setting specifies the SNMP Trap Receiver Name.
SNMP Trap IP Address	(When SNMP Trap is enabled) This setting specifies the SNMP Trap IP Address.

By clicking the **New** button next to **SNMPv1/v2 Communities** or **SNMPv3 Users**, you can add new communities and users accordingly.

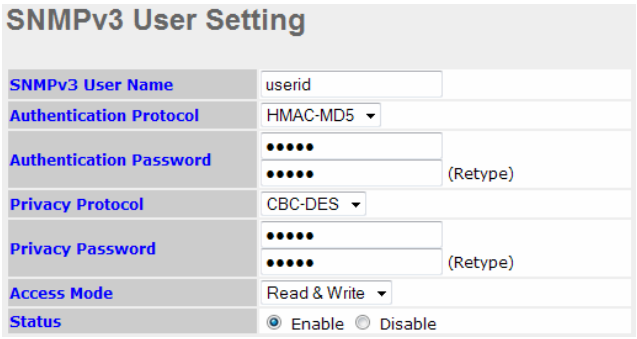
5.5.1 SNMPv1 / SNMPv2 Communities

By adding SNMPv1/v2 Communities, access rights can be controlled.



SNMPv1 / SNMPv2 Communities	
Community Name	The “password” for getting or setting SNMP values.
IP Address and IP Mask	The allowed subnet address who can access the SNMP server
Access Mode	Choose the access mode for this community name to either **Read Only** or **Read & Write**.
Status	Select to **Enable** or **Disable** this community.

5.5.2 SNMPv3 Users

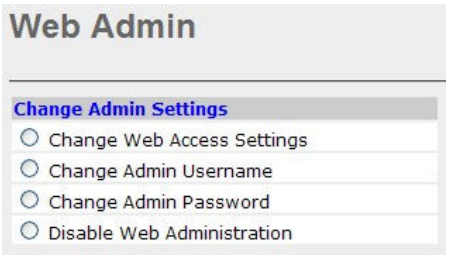


By adding SNMPv3 users, access rights can be controlled.

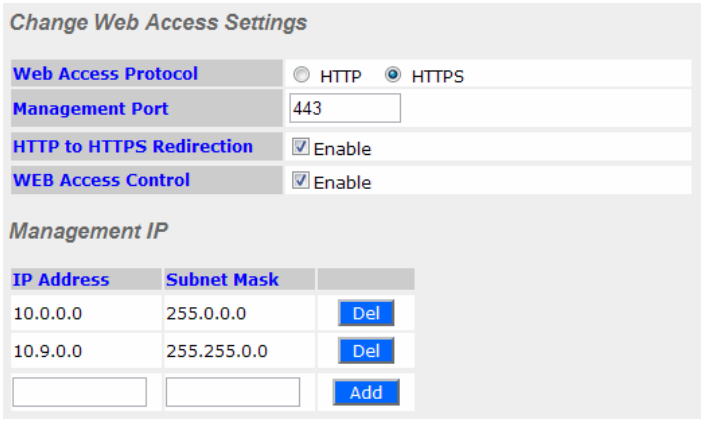
SNMPv3 User Setting	
SNMPv3 User Name	The user ID to be allowed to access the SNMP agent.
Authentication Protocol	The protocol for authenticating the user. Available options are: **HMAC-MD5** and **HMAC-SHA**.
Authentication Password	Only users provided with a correct password will be granted the right to access the SNMP agent.
Privacy Protocol	The encryption method to be used in SNMPv3 communication. Available options are: **None** and **CBC-DES**.
Privacy Password	(When CBC-DES is chosen as the Privacy Protocol.) This is the key for decrypting the encrypted data.
Access Mode	Grant **Read Only** or **Read & Write** access to this user.
Status	Select to **Enable** or **Disable** this user.

5.6 Web Admin Settings

Upon selecting ***Web Admin Settings*** from *the* ***navigation bar*** on the left-hand-side of the Main Menu, the following is displayed to enable to configuration of the parameters of the management interface:



5.6.1 Change Web Access Settings

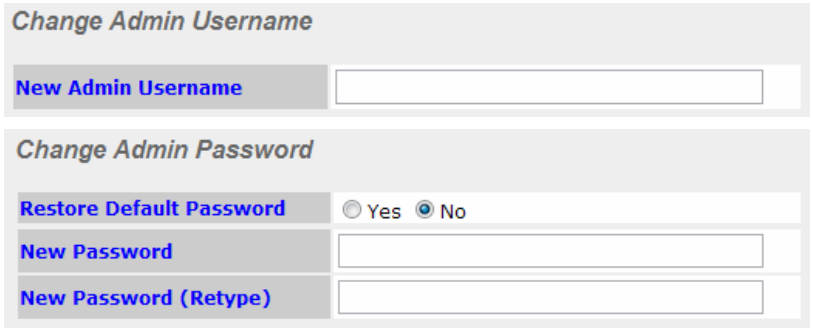


Comment: New details

Change Web Access Settings	
Web Access Protocol	This option specifies the protocol for web access of the device. By default, it is set as **HTTPS**.
Management Port	This option configures the TCP port number of the secure web server. By default, the TCP port number is **443**.
HTTP to HTTPS Redirection	With this option being enabled, user who accesses the web admin with HTTP protocol will be redirected to HTTPS automatically.
WEB Access Control	Select to enable the web access control feature and the Management IP settings will be available.

5.6.2 Change Admin Username / Password

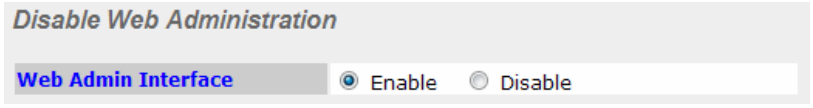
The selection Change Admin Username / Password configures the administrator password for entering Web Admin Interface. To change to the Username, enter the new username into the **Username** input fields. To change to the password, enter the same new password into the **New Password** and **New Password (Retype)** input fields.



5.6.3 Disable Web Administration

The selection Disable Web Administration turns off the access to Web Administration Interface.

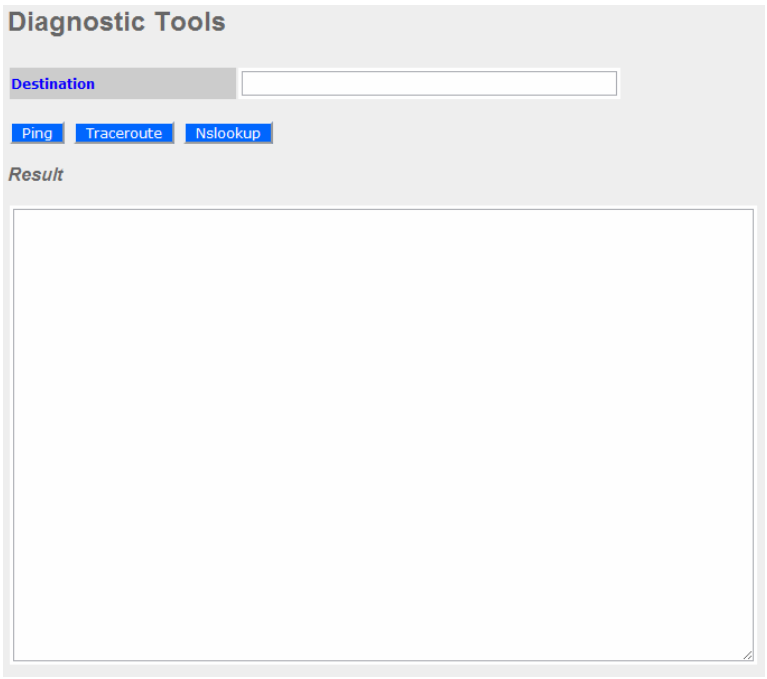
After being turned off, Web Administration Interface can be re-enabled using SNMP.



Comment:

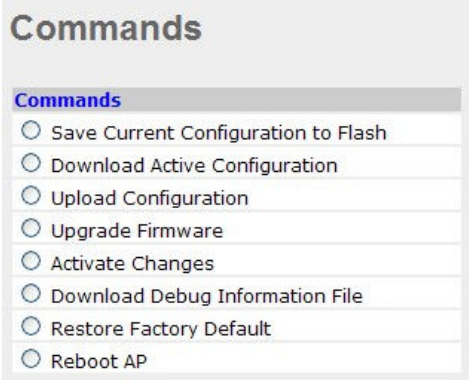
6 Diagnostic Tools

This provides three useful tools for diagnosing the network. The three available options are: **Ping**, **Traceroute** and **Nslookup**.

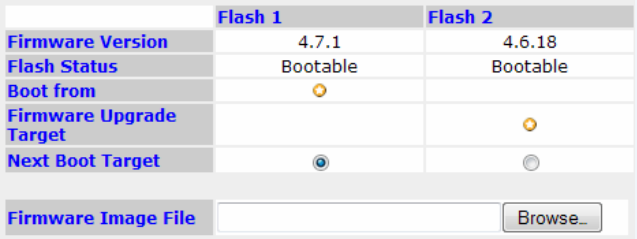
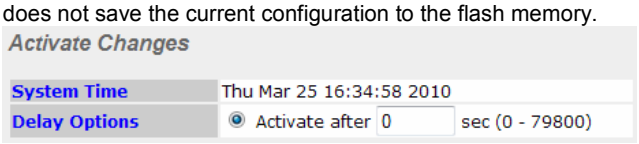
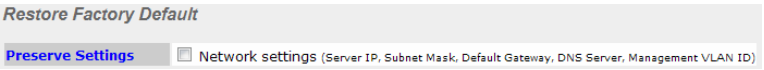
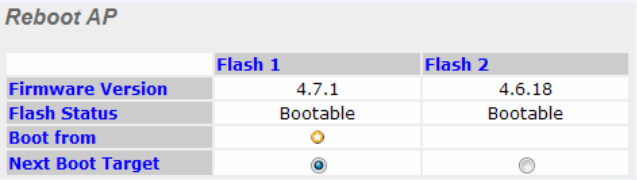


7 Commands

Upon selecting ***Commands*** from the ***navigation bar*** on the left-hand-side of the Main Menu, a list of commands is displayed, as follows:



Commands	
Save Current Configuration to Flash	Changes made are not saved to the flash; as a result, the current configuration will be lost after reboot. To make the current configuration persistent across reboots, choose **Save Current Configuration to Flash.**
Download Active Configuration	Select this command to download the active configuration for backup purposes.
Upload Configuration	Select this command to upload the configuration from a backed up configuration file. The configuration changes are not immediately effected after uploading, but are effected upon the selection of **Activate Changes**. *Upload Configuration* Configuration File Browse...
Upgrade Firmware	Select this command to upload a firmware file for upgrading the unit's software. A reboot is required after upgrading the firmware.

<table>
<tr><td></td><td>Upgrade Firmware
 
</td></tr>
<tr><td>Activate Changes</td><td>This is for activating saved changes; but note that the activation of changes does not save the current configuration to the flash memory.
 
</td></tr>
<tr><td>Download Debug Information File</td><td>Select this command to download debugging information from the MultiAP 700G unit.
In the event of technical issues, to facilitate prompt resolution by technical support from MultiAP, please send along with a debug file with the support request.</td></tr>
<tr><td>Restore Factory Default</td><td>This command to restore the device to factory default settings. Users may check the box to preserver network settings, including Server IP, Subnet Mask, Default Gateway, DNS Server and Management VLAN ID). Other configuration will be lost after the restoration.
 
</td></tr>
<tr><td>Reboot AP</td><td>This option is for rebooting the MultiAP 700G unit.
 
</td></tr>
</table>

Comment:

Note
Remember to click **Proceed** to activate your selected commands.

8 Per User VLAN tagging

MultiAP 700G supports VLAN tagging on per-client-session basis when 802.1x authentication is configured. The VLAN ID can be passed from the Radius server.

The VLAN ID to be set on a client session is passed from the radius server in a vendor attribute in the Access-Accept response called **Tunnel-Private-Group-ID**. When the **Tunnel-Private-Group-ID** attribute is present, the default VLAN ID setting will be overwritten with the value of the attribute.

Sample Radiator Settings

This is a sample Radiator ***users*** file for enabling the ***Tunnel-Private-Group-ID*** attribute:

```
login_id User-Password=abc123
Tunnel-Type=1:VLAN,
Tunnel-Medium-Type=1:Ether_802,
Tunnel-Private-Group-ID=1:2,
Service-Type = Framed-User
```

Appendix A.

Radius Server Setup

MultiAP 700G has been test to be functional with Radiator version 3.9, using the EAP-TTLS protocol.

For MultiAP 700G, configure the authentication protocol of the virtual access point to **WPA-AES:CCMP**.

Sample Radiator Settings

```
AuthPort        1812
AcctPort        1813
LogDir          /var/log/radius
DbDir           /etc/radiator
Trace          4
<Client DEFAULT>
        Secret  testing123
        DupInterval 0
</Client>
<Realm DEFAULT>
        <AuthBy FILE>
                Filename /etc/radiator/users
                EAPType TTLS
                EAPTLS_CAFile /etc/1x/cert/demoCA/cacert.pem
                EAPTLS_CertificateFile /etc/1x/cert/cert-srv.pem
                EAPTLS_CertificateType PEM
```

Appendix B.

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

1) Reorient or relocate the receiving antenna.

2) Increase the separation between the equipment and receiver.

3) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

4) Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IMPORTANT NOTE

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.